In such an onerous task as that of describing this mass of varied forms, one always, as the author observes, "runs the risk of either doing too much or too little in the way of creating species"; but he contents himself with the reflection that in the light of the theory of descent this danger is of little consequence.

In the carrying out of the troublesome duty of making the many thousands of required measurements, the author gratefully thanks his friend Dr. Reinhold Teuscher, of Jena, for the patient and careful manner in which he performed this part of the work. The figures of new species, about 1600 in number, which appear in the atlas accompanying the Report, were nearly all drawn with the camera, partly by Mr. A. Giltsch and partly by Prof. Haeckel; but the former has drawn all the figures on the stone in a very masterly way, so that the illustrations present a splendid series of beautiful forms, like the stars in the firmament for number, and surpassing these in the wonderful diversity and complexity of their outlines.

It was indeed a fortunate circumstance that so distinguished a naturalist, with such an intimate knowledge of the Radiolaria, should have been willing to undertake such a task, and exceedingly fortunate for science that he should have been enabled thus to finish it.

A GERMAN TREATISE ON THE VEGETABLE KINGDOM.

Die natürlichen Pflanzenfamilien. Von A. Engler und K. Prantl. (Leipzig: Engelmann, 1887, &c., being issued in numbers at irregular intervals.)

WITH the first three numbers of the above-named work, which are now before us, Profs. Engler and Prantl have embarked on an enterprise of some magnitude. The editors, having recognized the want of a comprehensive treatise, in German, on the Vegetable Kingdom, which should at once be scientifically sound, and yet be written in a style suitable for the use of those who are not professed botanists, have determined to meet that want. With this object they have enlisted the assistance of a number of collaborators: anyone who is conversant with the literature of Botany produced in Germany in recent years will see, on reading the list of names, that Dr. Engler has secured the co-operation of a very powerful staff, including many of the most prominent representatives of the science in that country.

With their aid the editors propose to produce a work, extending to some 5000 pages octavo: the whole is to be divided into five parts, one of which will be devoted to the Cryptogams, under the editorship of Prof. Prantl; one will treat of the Gymnosperms and Monocotyledons, and the remaining three of the Dicotyledons, under the editorship of Prof. Engler. The production of the several parts will proceed simultaneously, and they will appear in numbers, at intervals during the next five or six years: thus the distribution of the cost (which in itself is not excessive, considering the quality and extent of the work) over a lengthened period, will bring the book within the reach of a wide constituency.

The first three numbers will give some idea of what will be the scope and character of the work as a whole. One of these is the first instalment of the *Palmæ*, by Dr. Drude. It opens with twenty-six pages of text, illustrated by numerous carefully chosen and excellent woodcuts, on the morphology and anatomy of the vegetative organs, the inflorescence, fruit, and seed of the plants of this order; then follow notes on the distribution, affinities, and uses of the family, and finally its classification. A detailed description of the genera succeeds this general treatment, and it is illustrated by numerous good figures representing the habit of the plants, and dissections of their flowers: this will, in fact, be somewhat like an illustrated and abbreviated "Genera Plantarum," written in German, and in a semi-popular though sound style.

The second number issued contains the *Juncaceæ*, by F. Buchenau, and the *Stemonaceæ* and *Liliaceæ* by Dr. Engler. The subject-matter is treated in the same spirit as the above, and it may be assumed that this method will be pursued throughout the whole work.

But a more special interest attaches to the number which was third in its order of issue; and that on two distinct grounds: first, because from it we gain a more general idea of the plan and scope of the work, and secondly because it is chiefly the work, and probably the last work, of the late Prof. Eichler, a botanist whose loss will be very widely felt (see NATURE, vol. xxxv. p. 493).

The first pages of this number, written by Dr. Engler, give in brief the general plan of the whole work; the main lines of classification being those in common use, though some of the terms used have not as yet been generally accepted. They are as follow:—

I. Mycetozoa.
II. Thallophyta:
    (*a*) Schizophyta.
    (*b*) Algæ.
    (*c*) Fungi.
III. Embryophyta zoidiogama (= Archegoniatæ):
    (*a*) Bryophyta.
    (*b*) Pteridophyta.
IV. Embryophyta siphonogama (= Phanerogamæ):
    (*a*) Gymnospermæ (= Archispermæ).
    (*b*) Angiospermæ (= Metaspermæ).

Then follows the general treatment of the Gymnospermæ, of which four classes are distinguished, the Cycadinæ, Cordaitinæ, Coniferinæ, and Gnetales. It is worthy of note that here the fossil forms are taken into account, and Cordaitinæ, as well as fossil forms of the Cycadaceæ and Coniferæ, are described in their proper places. It will be unnecessary after what has already been said to follow the mode of treatment of the Gymnosperms further; suffice it to say that, while due prominence is given to the external morphology and classification, the results of recent investigation on the development of the sporangia and embryo find a place, *e.g.* those of Treub and Warming on the Cycads, and of Strasburger and others on the Coniferæ. A peculiar interest will attach to the pages on the morphology of the female cone in the Coniferæ, since this will be the last expression of the opinion of Eichler on a subject to which he had devoted special attention.

While extending a welcome to this new enterprise, we may compare it with other undertakings of a somewhat similar nature. Among the comprehensive classificatory works of recent years, the most prominent is

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the "Genera Plantarum" of Bentham and Hooker; but the most ardent admirers of that solid book could not expect it to appeal to the laity: it is designed for the use of specialists, and they alone will use it. Between this and the illustrated text-books intended for students there has been hardly any intermediate in this country, though Lindley's "Vegetable Kingdom," a book which still holds its place as a classic, served in the past a part not altogether unlike that which Dr. Engler's book may be expected to serve in the future. It is, however, in France that the nearest approach has been made to the idea of Dr. Engler. In the "Traité de Botanique" of Le Maout and Decaisne we have a volume profusely illustrated, and dealing with the vegetable kingdom as a whole: the English translation of this, edited by Sir J. D. Hooker, is familiar to all British botanists. Again, the "Histoire des Plantes" of Baillon, which is still in progress, is a classificatory work of large size, well illustrated as regards external morphology, but somewhat deficient in description of the internal details: his "Dictionnaire de Botanique," which commenced in 1876, is also still in progress, and covers, in dictionary form, much the same ground as his "Histoire." These are, then, the chief illustrated and descriptive works with which Drs. Engler and Prantl will have to compete. If we may judge from the first three numbers, the competition, though keen, will be in favour of the new enterprise, and that chiefly on the ground that the authors of it take a more general view of the subject. They do not confine their task to the description and delineation of external form, classification, and distribution. While giving due prominence to these branches, they also incorporate the results of recent investigations of anatomy and development. F. O. B.

OUR BOOK SHELF.

Nomenclature of Colours for Naturalists, and Compendium of Useful Knowledge for Ornithologists. By Robert Ridgeway, Curator, Department of Birds, United States National Museum. Ten coloured plates, and seven plates of outline illustrations. (Boston: Little, Brown, and Co., 1887.)

THIS will be a very welcome volume to naturalists in general, and ornithologists in particular. We do not know that everybody will agree with the principles laid down by the author, but he has, at all events, brought together a considerable number of colours, and given them very definite names for purposes of comparison, and a mere glance at the coloured plates will show how very important it is that every variety of green shown in Plate 10, for instance, should have its special name and admit of easy reference.

The comparative vocabulary of colours, which occupies a considerable proportion of the first part, is also a very valuable combination, and should be in the hands of naturalists of all civilized countries, as we get the English, Latin, German, French, Spanish, Italian, Norwegian, and Danish equivalents of all the colours shown in the coloured plates, and a great many more.

The *pièce de résistance* in the part of the volume which has been prepared chiefly for the use of ornithologists is a glossary of technical terms. It seems to us to have been very carefully done. A study of the plates illustrating the various feathers of birds, and the various birds' eggs, with the attached nomenclature, is certain to lead to a gradually increasing care in description. There is no doubt that the book will prove of very great value to many naturalists.

English Tobacco Culture, &c. Edited by E. J. Beale, F.L.S. (London: E. Marlborough and Co., 1887.)

THIS little book will serve as an important guide to farmers in conducting experiments in the cultivation of tobacco. It gives a detailed account of the origin of the movement for determining whether tobacco could be relied upon as a farm crop in Great Britain, and, if so, whether it could be cultivated to yield a profit to the grower. These two questions, it is maintained, have been answered in the affirmative by the results of last year's experiments, but this conclusion is founded more upon the appearance of the plants than upon actual results in the production of good commercial tobacco.

Seventeen varieties of tobacco were grown last year in this country, and a full description is given of the plants of each variety, with well-executed illustrations, showing the general appearance and distinctive features of the fully-developed plants. For each description of tobacco grown an "Estimated Balance Sheet" has been prepared, and the anticipated profit, amounting in some cases to as much as £25 and even £27 per acre, is very encouraging for farmers who may think of undertaking experiments in tobacco cultivation.

Perhaps the most useful part of the book is that devoted to directions for conducting the several operations of tobacco culture. These include the preparation of the land; the sowing of the tobacco seed; the transplanting of the young seedlings; the transferring of the plants to the prepared ground; and their subsequent treatment until finally harvested and cured. Altogether the book is prepared with great care, and its publication at the present time is very opportune.

Life of Charles Darwin. By G. T. Bettany. (London: Walter Scott, 1887.)

THIS is one of the series of volumes entitled "Great Writers." It was not to be expected that Mr. Bettany would be able to tell us anything absolutely new about the illustrious man of science concerning whom so much has already been written. He has, however, succeeded in presenting in a bright and attractive style the leading facts of Darwin's career, and he has done good service by taking pains to show that Darwin was not only a great thinker and discoverer, but a man of a singularly pure and noble character. Mr. Bettany's exposition of the results of Darwin's labours is brief, but clear and accurate, and he tries to mark as distinctly as possible the various stages in the process by which the theory of evolution as Darwin conceived it was itself evolved.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

Thought without Words.

MAY I demur to the Duke of Argyll's statement that monkeys and dogs have no true reasoning powers? Long and careful attention given to the action of animals consequent on true reasoning power, has led me to an opposite conclusion. I do not trouble you with instances, or could give very many; and I have frequently seen reasoning power exercised after obvious thought over the best course to pursue. Then, *are* animals speechless among themselves? I think not, and believe they speak freely to one another at needed times, in their own language. And I certainly with my own domestic animals can understand in a certain sense their language. I clearly know

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